

ATTACHMENT

**NCR ( NO CARBON REQUIRED ) PAPER**

**1. NCR Paper Description and Function**

- a. NCR paper is now made exclusively by the National Cash Register Company who in turn sell it as a basic raw material to printers manufacturing primarily manifolding and other specialty-type forms. Three basic types of NCR paper are produced:

- (1) CB - the top or original sheet (coated back)
- (2) CFB - the intermediate sheet (coated front and back)
- (3) CF - the back or last sheet (coated face)

Every set must contain at least a CB sheet and a CF sheet. If more than 2 parts are required additional CFB sheets must be inserted between the CB and CF sheets.

- b. Carbon paper is not needed to produce copies from NCR paper provided the sheets in the set are assembled in proper sequence. The transfer quality of NCR paper is a result of the interaction of two dissimilar color reactant coatings. The back of the first and all intermediate parts in a set bear a pressure rupturable dry-to touch coating consisting of minute liquid droplets of a distinctive color reactant held in suspension. The face of the receptive sheet (the last sheet in a set and each intermediate sheet) is coated with small solid particles of a different kind of color reactant material. The impact of mechanized type (typewriter, letterpress printing, EAM, bookkeeping or other systems machines) or the pressure exerted by the point of a pencil or ball point pen brings the two dissimilar chemical coatings into direct contact rupturing the suspended liquid reactant. This liquid is immediately absorbed by and combined with the solid reactant. The resultant combination of these two chemicals turns the impacted face areas blue leaving a sharp clear smudge proof impression.

- c. The most popular and effective NCR paper base stock for forms is a sulphite register bond. The weight of this paper after coating (based on 500 sheets, 17" x 22") is as follows:

- (1) CB - - - - - 15 $\frac{1}{2}$  top or original sheet
- (2) CFB - - - - - 17 $\frac{1}{2}$  intermediate sheets
- (3) CF - - - - - 15 $\frac{1}{2}$  back or last sheet

- d. NCR paper sets produce satisfactorily legible copies for:

- (1) Handwritten forms-----up through 5 parts
- (2) Electric typewriter-----up through 8 parts
- (3) Manual typewriter-----up through 7-8 parts  
depending upon pressure of the stroke
- (4) Tabulating machine forms-----up through 5 parts  
on IBM 407 tabulators.

- (5) Letterpress printing-----7 parts, may  
produce more experience lacking
- (6) Other equipment-----No Agency  
Experience to date.

2. NCR Paper Limitations . Wide spread, extended use of NCR paper will continue to be somewhat limited for sometime to come because:

- a. Procurement costs are moderately higher.
- b. More care must be exercised by the printer to handle, print and perforate.
- c. Printers sometimes have difficulties in procuring roll stocks in required colors and amounts from the manufacturer. This may increase prices or delay deliveries.
- d. Erasure destroys the solid color reactant with which the face of each sheet in the set (except the first) is coated. Retyping after erasure produces at best only a partially formed or indistinct image. This makes use of NCR paper sets impracticable for correspondence purposes without lowering standards to permit strike-overs and retyping as this is the only practicable means of correcting an error.

3. NCR Paper Prospectus. While NCR paper is intended to compete eventually on a cost basis with interleaved carbon forms, it has not always done so to date. NCR paper forms are often more costly than carbon interleaved forms, and no doubt will so continue until a considerably less expensive means can be developed for treating the paper or competitive products are developed by other manufacturers. There is little doubt, however, that improvements will, in time, overcome many of the present limitations. It seems certain that NCR paper forms will eventually replace substantial numbers of carbon interleaved forms, especially in the security agencies.